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Recreation and
Parks Division
Canyon Ferry

1977



CANYON FERRY

management and development plan
and environmental impact statement

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PREFACE

Canyon Ferry Reservoir and its environs are administered by both state and federal agencies with a variety of responsibilities and goals. Among these agencies is the Montana Department of Fish and Game which has administrative authority on both land and water.

The main objective of this planning effort is to determine what the long-range management direction will be for Canyon Ferry Reservoir. To define this direction, a management plan is desired that will provide the best mix of land use benefits to satisfy existing and projected land use demands. Defining what is best, however, is not an easy task. Conflicting and rising demands are increasing for the fixed number of acres available as well as the use benefits which the acres can provide. Any land allocation will permit some uses at the expense of other uses.

The contents of this booklet will acquaint you with the planning approach that is employed and factors that are considered in planning. The enclosed Management Alternatives, contained in Part I, are intended to tell how Canyon Ferry Reservoir could be managed within the constraints of land capability and funding limits of the Department of Fish and Game.

The environmental statement, encompassing Part II of this booklet, is necessary because of a range of resource management options. Allocation of land to new uses together with retaining or modifying patterns of use on the remaining acreage, will directly affect the natural, social and economic environment.

The following study consists of a broad management and development plan for the activities of the department at Canyon Ferry and an environmental assessment of that plan. The emphasis will be upon the efforts to improve the recreational opportunities at Canyon Ferry and upon the protection and enhancement of the resources found there. It must be emphasized that anticipated improvements and necessary operations and maintenance of recreational areas are dependent solely on legislative appropriations for such planned development. This plan is therefore a theoretical framework for justification of such appropriations.

In the past, development efforts, especially at organized recreation sites have attempted to keep abreast with the increasing demand for such areas at Canyon Ferry. Work by the Recreation and Parks Division has consisted largely of stopgap measures to solve immediate problems. In cases where long-range goals and plans have been identified, the passage of time and changes in recreational needs have made it necessary to take a new look at demands made on this particular resource.

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I. management and development plan



A. description of the existing environment

1. description of the area

a. region

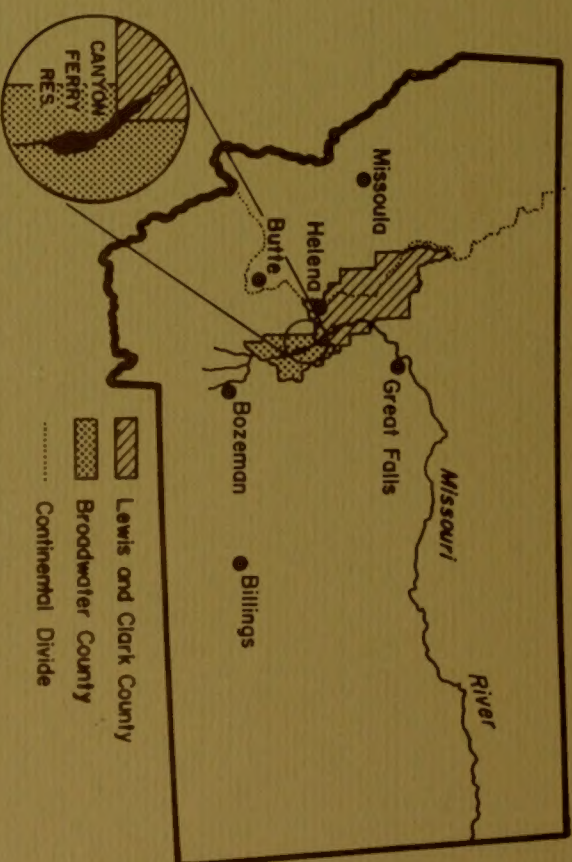
Lewis and Clark County is one of the most mountainous counties in Montana. The county contains fairly large valleys, the city of Helena lying in the Helena Valley proper.

Mountains cover 45% of Broadwater County and are located in the northeast and northwest portions of the county. Near Toston the county stretches into plains and bottomland.

Population from urban centers within a relatively few miles of the reservoir account for most of the recreationists using Canyon Ferry Recreation Area. The city of Helena lies only 15 miles from the northern end of the reservoir; Townsend is only 3 miles from the southern end of the reservoir; and White Sulphur Springs is approximately 30 miles from Highway 284 paralleling the eastern shore.

Canyon Ferry Reservoir lies in a large valley bordered by the Big Belt Mountains to the east and the Elkhorn Mountains on the west. The Spokane Hills are a projection from the Elkhorn Mountains; the steep slopes on the western shoreline of the reservoir are part of the Spokane Hills. A deep gorge in the north end of the valley separates the Spokane Hills and Big Belt Mountains. The Missouri River leaves the valley at this gorge through Canyon Ferry Dam.

VICINITY MAP



b. the dam and reservoir

Canyon Ferry Dam is 172 feet high above streambed, 1,050 feet long and contains three generators which have a combined production capacity of 50,000 kilowatts. Total

capacity of the reservoir is 1,946,624 acre feet, of which the top three feet, or 104,300 acre feet, are allocated for flood control.

The reservoir created by the dam covers 35,200 acres and extends 25 miles to the south along the Missouri River Basin to within a few miles of Townsend. At its widest, the reservoir is 5 miles wide, narrowing to an average width of 2 miles.

Built by the Bureau of Reclamation, primarily for irrigation and control purposes, the reservoir is filled during the spring runoff (May and June), is drawn down during the growing season for irrigation, and is usually also drawn down during fall and winter in anticipation of the spring runoff. The usual water level fluctuation does not exceed 25 vertical feet in any one year.

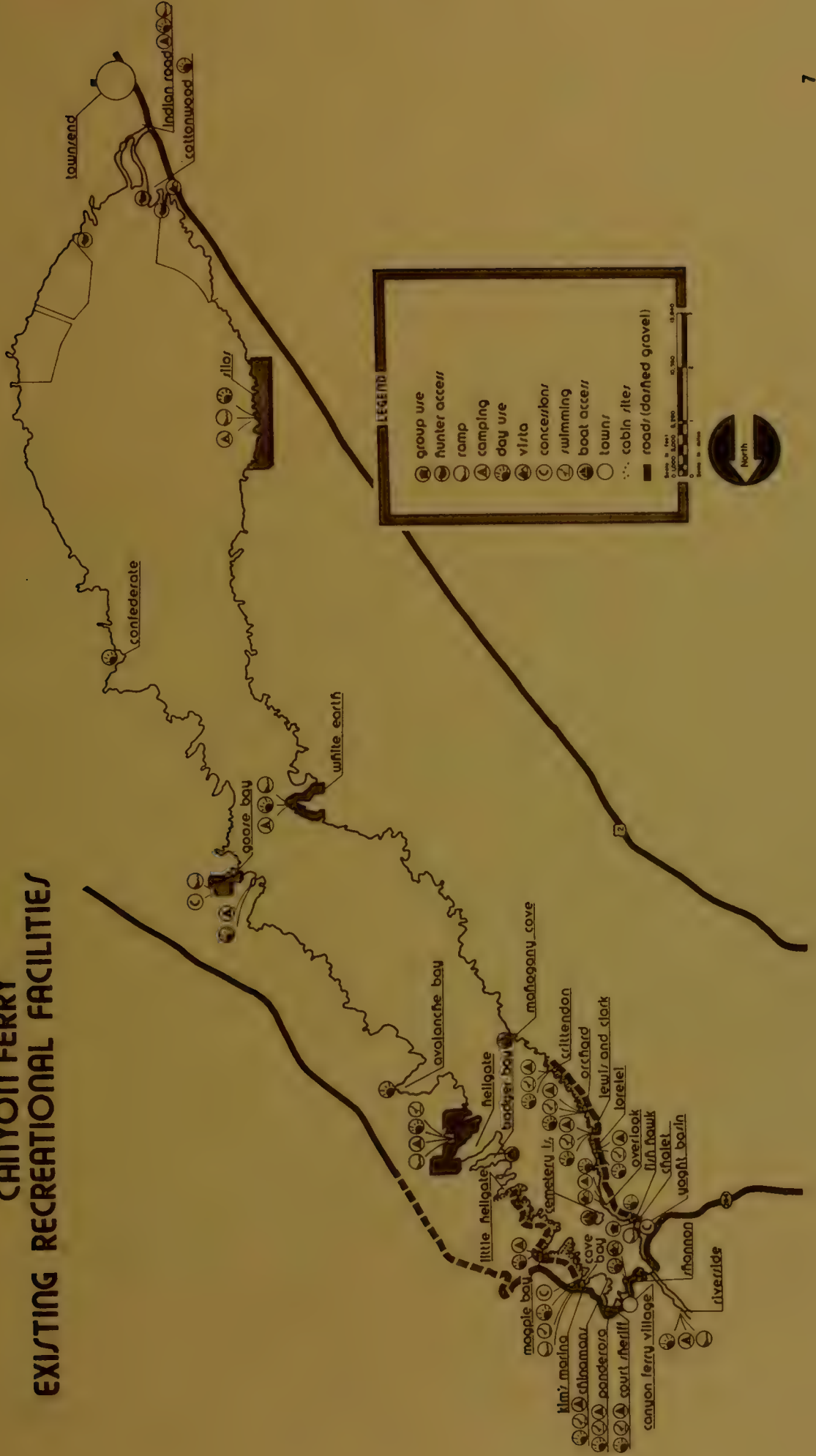
Water temperatures range from 32°F at the surface when ice covered, to 75°F in shallow bays during the summer. Bottom temperatures in the deepest portions approach 39°F even during the warmest summer period.

c. recreation sites

In 1957, an agreement between the Bureau of Reclamation and the State Parks Division, then under the Highway Commission, gave authority to the state to develop and administer recreation sites on Canyon Ferry Reservoir. The Parks Division agreed to operate and maintain all recreational facilities at its own expense. Magpie Bay was one of the first sites to receive tables and sanitary facilities. In the early 1960's the Bureau of Reclamation agreed to furnish

money for minimum basic health and safety facility development of Chinaman's Bay, Cave Bay, Beaver Creek, Hellgate, Townsend day-use area, Confederate Gulch and Overlook Recreation Areas, as well as four areas on the west shore. In 1966, the Bureau of Reclamation provided additional funds for basic health and safety facilities at Riverside, Cemetery Island, Court Sheriff and Hellgate Recreation Areas and more facilities for the west shore areas. The Chalet and Fishhawk Areas on the west shore were first leased to the National Guard in 1964 for the purpose of providing recreational areas for National Guard members. In 1976 these areas were turned over to the Department of Fish and Game for administration. At the present time, Canyon Ferry Recreation Area is made up of 24 recreational sites surrounding the entire reservoir.

CANYON FERRY EXISTING RECREATIONAL FACILITIES



▲ Airports
..... Burlington Northern R.R.

LOCATION MAP



2. physical environment

a. visual setting



Crops grown are principally alfalfa, wheat, barley and native hay.

The area currently inundated was once very fertile, valley bottom, agricultural land. The valley has been filled to an elevation of 3,800 feet (mean sea level). The west shore of the reservoir is considerably steeper than the east shore, except immediately around the dam site and Canyon Ferry Village to about Chinaman's Gulch. Four to five miles from the shoreline on the east side, the Big Belt Mountains stretch to elevations up to 6,000 feet (mean sea level). Ten miles from the upper end of the reservoir, the east shoreline becomes very flat.



Severe and steep banks line the shoreline at the dam site on the western shore. The terrain remains steep at 4,000 to 5,200 feet elevation (mean sea level) as part of the Spokane Hills until about two miles past Mahogany Cove public-use area, and then gradually grades to rolling hills. Near the Silos public-use area, the terrain becomes flat.

b. geology

Geology at Canyon Ferry can be divided into four major geological types--tertiary lake beds, igneous formations, quaternary alluvium, a sedimentary formations which have been identified from rock outcroppings.

1.) Tertiary Lake Beds

The first geologic type--tertiary lake beds--covers most of the northeast and southwest portions of Canyon Ferry area. These tertiary deposits overlie eroded surfaces of folded and faulted older rocks and underlie most of the younger sediments in the Townsend Valley. Tertiary lake beds have been identified mostly on the gently sloping plains, characteristic of the eastern shore butting up against the Big Belt Mountains and the western shore sloping down from the Spokane Hills and Elkhorn Mountains. Characteristics of the tertiary lake beds of the Oligocene series are light-colored, fine-textured sediments and small amounts of interbedded sand and gravel, along with some finer grained volcanic ash. East of the Spokane Hills the tertiary deposits are identified as conglomerate interbedded with red shale and some bentonitic beds. The land southwest of the Big Belt Mountains is comprised of reworked tuffaceous material without bentonite, and identified as fine sand to coarse gravel. Tertiary deposits of the Miocene series are poorly exposed, but have been found in bluffs that border the east bank of the Missouri River between Confederate Gulch and Canyon Ferry Reservoir. Characteristics of the Miocene tertiary beds are light to buff colored sandy clay, and sand and gravel beds overlain by conglomerate. Tertiary rocks are from 4,000 to 6,000 feet thick in the Townsend Valley.

2.) Igneous Formations

Igneous rocks intrude into the sedimentary deposits in the Townsend Valley, occurring as dikes, stocks, sills and small plugs.

Outcroppings of igneous rocks have been identified on the west shoreline from Yacht Basin concession area to Crittendon public-

CANYON FERRY RESERVOIR

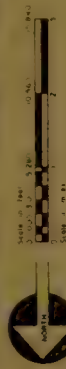


GEOLOGICAL

legend

- tertiary lake beds
- igneous formations
- quaternary alluvium
- sedimentary formations

CANYON FERRY RESERVOIR



SOILS

legend	
	loamy, hilly, uplands
	deep, loamy, well drained
	deep, well drained, fans
	deep, poor drained, flood plain
	deep, well drained, terraces
	deep, well drained, silt loam
	deep, well drained, high terraces
	deep, well drained, int. terraces
	shallow, well drained, uplands
	deep, gravelly loam, calcareous

use area. Igneous rocks have been classified into five principal types but occur basically as fine to coarse textured rocks consisting of different mineral mixtures. Generally, igneous rocks occur as relatively thin sills, intruding between beds of other rock.

3.) Quaternary Alluvium

Very young sediments of quaternary alluvium were deposited in the Townsend Valley when swamps, lakes and streams were abundant. Quaternary alluvium deposits have been identified in the bottomland terrain on the southeast part of the reservoir, in drainageways on the eastern shore of the reservoir and gently sloping drainageways on the western shore of the reservoir. Alluvium deposits, being deposited on folded and eroded surfaces of tertiary and older rocks, are comprised of granite, quartzite cobbles, sand, silt, and gumbo clay or bentonite of not more than 60 feet thick. Thicker and coarser textured alluvium is found near the mountains whereas thinner and finer textured material may be found toward the valley.

4.) Sedimentary Formations

The last general geological type found in the Canyon Ferry area is sedimentary formations. The Big Belt Mountains to the east of Canyon Ferry Reservoir, and the Spokane Hills to the west, are similar geologically. The oldest rocks in the Big Belt Mountains and Spokane Hills are some of the sedimentary rocks. These rocks were at one time mud and sand in the bottom of a sea that covered this area more than 1,000 million years ago. Heat and the weight of overlying formations have changed these sediments into rocks. Younger sedimentary rocks, such as sandstone, limestone, and shale, can be seen overlying the very old rocks.

G. SOILS

The area immediately surrounding the dam site, both shores of the Missouri River after it leaves the reservoir, the east shoreline to Magpie Bay, and a large portion of the west side of the reservoir on the northern end consists of loamy, hilly uplands, with elevations between 4,000 to 5,000 feet (mean sea level). The surface layer is extremely thin and covered with gravel and cobblestone.

The soil at the White Earth public-use area is deeper and the terrain not quite as steep as around the dam site.

Approximately 4 miles from the reservoir, on the western side, the terrain fans out from the mountainous area nearer the reservoir. The gradually sloping hills are covered with deep, loamy soils to less than 20 inches to bedrock.

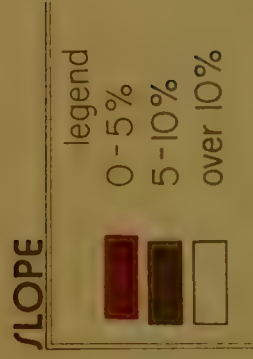
A stretch of shoreline on the southeastern portion of the reservoir and two drainage creek areas on the east shoreline and comprised of deep, poorly drained floodplain. Townsend also lies on this floodplain. The silty and loamy soils are found on smooth, moderate sloping areas. The surface material is gravelly and stony.

In the Silos area and a large area paralleling the west shoreline, this gravelly, loamy soil type is deep, up to 20" to bedrock consisting of limestone, with well-established drainageways.

The area west of Highway 12 and Townsend at the southern end of the reservoir is very hilly and gradually slopes to the Missouri River. Good drainageways are established from the Elkhorn Mountains to the Missouri River. The surface material is very stony and gravelly.

The shoreline area adjacent to the very steep uplands from Yacht Basin to Crittendon public-use area on the west shore and the area from

CANYON FERRY RESERVOIR



Magpie Bay to Hellgate Bay on the east shore is comprised of shallow, gravelly, calcareous, loamy soils. The surface material is very coarse.

A large portion of the east shore from Hellgate Bay to Confederate Bay consists of deep, well-drained terraces. The gently sloping terrain extends approximately four miles from the reservoir to the base of the Big Belt Mountains. Another area of this type of soil continues along the east shoreline and part of the southwest shoreline surrounding the newly constructed retention dikes. These silty and loamy soils have moderate permeability. The topsoil is shallow but loam extends down to about 20 inches to bedrock.

An accumulation of silt from the loamy mountainous lands on the western shore lies at the base of the mountains on the lower slopes. These soils are much deeper, especially in basin areas and heads of drainageways. The surface material again is rocky and gravelly and uses much the same as the steep mountainous area.

Deep, well-drained high terraces are found along the west shoreline. The terrain gradually slopes to lower elevations toward the southern end. The topsoil extends down less than 20 inches to granite bedrock.

At the southern end of the reservoir a dust abatement program is currently under construction by the Bureau of Reclamation to alleviate the extensive wind erosion resulting from fluctuations in the surface level of the reservoir. Construction completion is slated for the end of 1978. During those 2 to 4 months in the spring when the reservoir is low, there can potentially be 9,000 acres of bottomland silt subject to gusty wind. Approximately 10 miles of silt retention dikes are currently under construction which will create 1,870 acres of ponds 3 to 5 feet deep behind the retention dikes. These ponds will cover the annually exposed bottomland

year-round and prevent wind erosion. These ponds and islands will prove beneficial to migratory bird populations.



is contained in fissures or solution channels. Rainfall and snow-melt recharge the ground water in the higher elevations; perennial mountain streams, irrigation canals and laterals, and seepage from irrigation water recharge ground water in the valley areas. Precipitation in the Townsend Valley penetrates to only a shallow depth and does not recharge the ground water except in the lower part of the valley where the water table is near the surface. Ground water in this area is mainly drawn for domestic and irrigation use.

Approximately 30 wells of record are located within 3 miles of Canyon Ferry shoreline. Of these 30 wells, 10 are owned by the Department of Fish and Game. Well depths range from 4 feet to 238 feet deep, but most are 30 to 150 feet. Yields from the wells range from 5 to over 200 gallons per minute (g.p.m.); however, yields of 20 to 50 g.p.m. are most common.

Very little information is available on water quality. However, analyses of a few springs and wells in the valley show the water quality to be potable. Total dissolved solids range from less than 100 to about 1,000 parts per million.

1. climate

Average annual temperature for Broadwater County is about 43 degrees with yearly average precipitation around 11 to 12 inches. Most of the yearly precipitation occurs from April to October with May and June being the wettest months. Valley snowfall is usually a little over 27 inches, although the mountains receive considerably more.

Average annual temperature for Lewis and Clark County is around 44 degrees, with average precipitation reaching 12 to 13 inches a year, as measured on the valley bottom. The mountains are cooler and receive considerably more precipitation during the



d. surface water

The Missouri River flows into the reservoir just north of Townsend, through Canyon Ferry Dam to form Hauser and Holter Reservoirs in Lewis and Clark County. Lake Helena, located in the Helena Valley, drains into Hauser Lake.

The Missouri River provides the major inflow into the reservoir. The average annual inflow, measured at the Toston gaging station, upstream from the reservoir, has averaged 3,747,000 acre-feet annually. Annual volumes have exceeded 5 million and fallen below 2 million acre-feet.

Eleven perennial streams enter the reservoir. Most of the runoff is from snowmelt of the Rocky Mountain Range along the Continental Divide at elevations above 11,000 feet (mean sea level). In the spring and summer months, much of the water in these creeks is diverted for irrigation. Thus, only a small amount of water from these small creeks reaches the reservoir.

The water quality in the reservoir is capable of supporting fish, is safe for swimming and potable upon filtration and treatment. The water near the shoreline becomes turbid during periods of wind or heavy use activity.

e. groundwater

Underlying the Townsend Valley is a large reservoir of ground water. Part of the ground water is under water table conditions in the quaternary and tertiary deposits; the other part of the ground water is confined under artesian pressure. In the pre-tertiary formations, ground water



year. The valleys have normal east-of-the-divide precipitation behavior receiving two-thirds to three-fourths of their annual precipitation during the growing season with definite seasonal peaks during May, June and September. Snowfall is minimal in the valleys, Helena receiving 25 inches a year.

The prevailing wind over Canyon Ferry Reservoir is from the southwest. Frequent storm fronts move along the slope of the mountains with high velocity winds (20 to 35 miles per hour) switching direction as the storm front passes.

Table I-1

Canyon Ferry Climatic Table

Years of Record	51*
Average Annual Temperature	43.7° F
Highest	104° F
Lowest	-41° F
Average Annual Precipitation	11.40 inches
Wettest Year	17.43 inches (1947)
Driest Year	6.01 inches (1919)

*Old Montana Power Site, 1900 - 1950 inclusive

g. air quality

In general, air quality at Canyon Ferry Recreation Area is good. The smelter at East Helena produces no particulate of significance; however, traces of lead and sulphur dioxide influence the air quality over the reservoir. Two teepee burners are also located at Townsend.

The greatest violation of air quality in the reservoir area is due to dust. Although wind erosion during drawdown has long been a problem at the southern end of the reservoir, this problem will be improved by

the dust abatement program currently underway. The gravel or dirt roads on both the east and west sides of the reservoir also contribute to the dust problem, as do the access roads to individual recreation sites and cabin site areas.

h. aquatic

Canyon Ferry Reservoir presently has a large population of rough fish-- carp and longnose and white suckers. Flathead chub and stonecat are also present. Rainbow trout are sustained largely through planting. The brown trout population is self-sustaining. A small mountain whitefish population maintains itself through natural reproduction.

Perch are numerous and although not a game fish, they are a popular sport species. Game and sport fish are most often caught from the shoreline and in bays.



The reservoir provides a more conducive habitat for nongame fish than for game fish as it does not have adequate spawning areas for game fish. For this reason, trout are planted each year. Salmon have been planted in the past on an "opportunity" basis, i.e., when available. The populations of rough and game fish compete to a certain extent for the same food.

The reservoir could support a larger volume of game fish if it were not for the large population of rough fish. No known endangered species of fish inhabit the reservoir.

Shellfish present include freshwater mussels, crayfish and snails. Aquatic plants are sparse; there are no known endangered species, however. Microflora are composed chiefly of blue-grass algae and diatoms. The reservoir bottom is not highly productive in microfauna, but it is assumed midges and aquatic insects exist although no studies have been performed. No endangered microfauna is known to exist in the reservoir.

I. wildlife

Big game populations exist in virtually the entire area surrounding Canyon Ferry Reservoir. Antelope and mule deer are found in relatively large numbers on both sides of the reservoir. On the west side of the reservoir, the range is considerably better than the range on the east side where a decreasing habitat is creating diminishing antelope populations. The white-tailed deer population is more selective, staying in the thickets found in Confederate Gulch and the southeastern and southern part of the reservoir. A small resident herd of elk maintains itself in the Spokane Hills, on the west side of the reservoir. Logging activity the past few years may be negatively impacting this herd.

The southern end of the reservoir supports a healthy population of beaver and muskrat. With the completion of the dikes at the southern end, the total fur-bearing population should increase. Confederate Gulch also has a small population of muskrats. Other small mammals in the area include raccoon, skunk, mink, and rabbits.

Pheasant, sharp-tailed grouse, and Hungarian partridge occupy areas where sufficient habitat exists. A variety of song birds, herons, hawks, owls, osprey and eagles inhabit the area.

Osprey are common along the periphery of the reservoir with nest sites at the southwest end of the area and along the west shore near the Spokane Hills.





CANYON FERRY RESERVOIR




WILDLIFE

- legend
- mule deer
 - water fowl

CANYON FERRY RESERVOIR



WILD LIFE

legend	
	antelope
	white tail deer

Nesting colonies of blue heron and cormorant are found at the south end of the reservoir. The rookeries are located on the river islands as the Missouri enters the reservoir.

Canyon Ferry is on a Pacific flyway and receives heavy fall traffic from migrating waterfowl. Their use of the area is increasing because of better habitat around the new dikes. Geese use all of the reservoir, but

specifically use the southern end for a nesting area and the bays on the east and west shores when migrating. Wild ducks use the reservoir, but also concentrate toward the southern end.

Ducks generally follow the same pattern of use as mentioned for geese. It is anticipated that the bays on the east and west shores will become more important as grain production increases on the lands above the reservoir.

j. vegetation

Plant life around Canyon Ferry Reservoir can be classified into two general groups--semiarid bunchgrass type and river bottom vegetation type.

Several different types of grasses have been identified in the semiarid bunchgrass classification at Canyon Ferry including blue gramma, needle and thread, blue bunch wheatgrass, Sandberg bluegrass, prairie junegrass, green needlegrass, bluestem wheatgrass, cheatgrass brome, smooth brome, and Indian ricegrass. Shrubs identified at Canyon Ferry are comprised of big sagebrush, rubber rabbitbrush, brome snake-weed, skunk brush, rose species, and willow species. Rocky Mountain juniper brush is found at higher elevations. Ponderosa pine and Douglas fir trees are found within the sloping timbered areas. Cottonwood and aspen trees can be found at lower elevations in drainageways where underground water is more abundant. Other types of vegetation found within this classification are asters, kochia, thistle, legumes and prickly pear.

Fertile river bottom land is found only at the upper end of the reservoir shoreline and immediately on either side of the Missouri River as it enters the reservoir. Grasses found on this river bottom land are listed here in order of dominance; reed canary grass, smooth brome, bluestem wheatgrass, slender wheatgrass, wild rye, blue gramma, and needle and thread. Characteristic of more fertile and moist soils in coulee bottoms and creeks, the species of shrubs found at the upper end of the reservoir are willow, rose, red dogwood, buffalo berry, and snowberry. Cottonwood and Russian olive trees exist in the lower drainageways. Other types of vegetation in this classification are cattail,



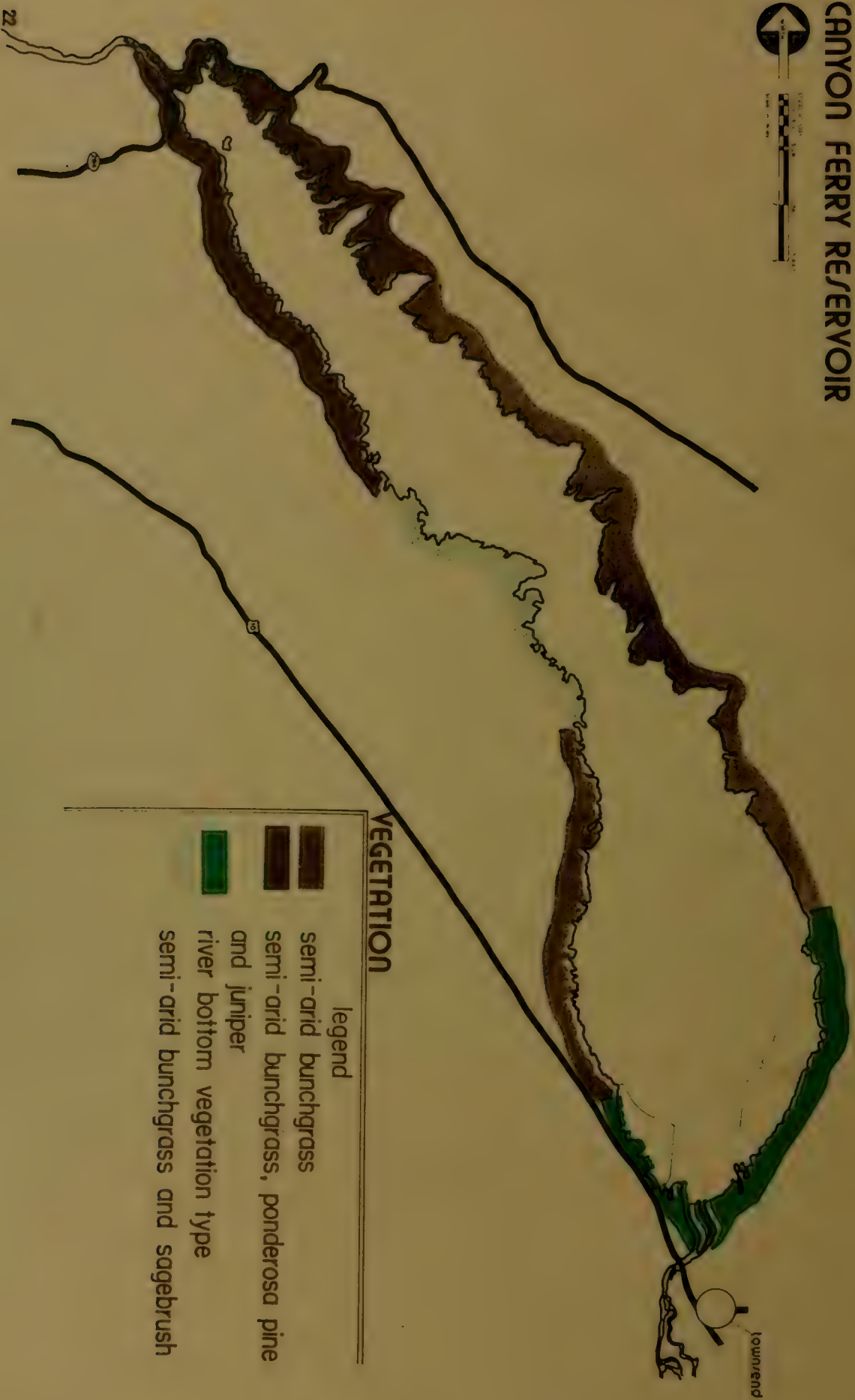
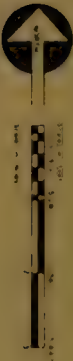
Some of the land is irrigated enabling ranchers to produce high quality alfalfa and native hay; other lands are dry farmed, producing wheat, barley, and other small grains.

3. human environment

a. historical and archeological

Blackfeet, Gros Ventre and Shoshone Indians are the historic tribes of this region.

CANYON FERRY RESERVOIR



VEGETATION

legend

- semi-arid bunchgrass
- semi-arid bunchgrass, ponderosa pine and juniper
- river bottom vegetation type
- semi-arid bunchgrass and sagebrush

Lewis and Clark passed through here in 1805 and Sgt. John Ordway descended the river in the following year. Thereafter, until the 1860's, few white men visited here, these being wandering bands of fur trappers.



Diamond City - Early Gold Mining Camp

This region surrounding Canyon Ferry had only minor contact with the white settler until the mid-1860's, when gold was discovered in Last Chance Gulch, in the present city of Helena. This discovery led to a tremendous influx of gold seekers, causing many new mines to be opened in the late 1860's and 1870's. Many of these mines were in gulches which presently carry the name of recreation sites at Canyon Ferry--Confederate Gulch, Whites, Cave, Avalanche, Hellgate and Magpie. Confederate Gulch, for instance, produced the richest mine on record in the United States. At one time during the peak of the gold rush, an estimated 10,000 people were mining the gulches around Canyon Ferry. Silver mining also came into importance at this time, contributing to the influx of miners and associated people. Those who could not make a living mining, turned to the land as a means of survival. This growing agricultural base proved essential in the early 1890's when the placer mines were exhausted and the silver market collapsed.

Agriculture and small enterprise had an economic base strong enough to keep the region growing and Helena became the state capital in 1894. During the same period in the early 1890's, several businessmen from Helena proposed a dam at Subbs Ferry, ten miles below the present Canyon Ferry Dam, but plans were unsuccessful.

Helena Water and Electric Power Company, the second group wanting to use the waters of the Missouri, started dam construction at Canyon Ferry in 1896. The dam and power plant were finished in October, 1898, creating a lake 7 miles long and 2 to 3 miles wide. Electrical power was supplied from the dam to the smelter in East Helena. The newly formed Missouri River Power Company purchased the dam and power station in December of 1900, but due to financial problems, the company merged into United Missouri River Power Company in 1911, which became Missouri River Electric and Power Company later that year. In 1912, the dam and power plant was again sold--this time becoming property of the then small Montana Power Company.

It remained in the control of Montana Power Company until early 1950, when the United States Bureau of Reclamation purchased it. The purchase of the old dam and power plant was to make way for a new dam which had been started in July, 1949. The purchase was made as part of the Missouri River Basin Project, authorized by the Flood Control Act of December 22, 1944. The dam was finished in April, 1954, when the plant began to produce electricity.

There is ample evidence of mining, transportation, and cultural activities of the previous century which gives Canyon Ferry Reservoir area a distinct frontier atmosphere. Much of this historic scene disappeared when the area was inundated.

No historical sites currently listed on the national or state register will be affected by implementation of this plan.

Various studies and inventories of archeological sites have been conducted over a period of years in the Canyon Ferry area. Specific locations of these sites may be obtained by contacting the State Historic Preservation Officer, Montana Historical Society, Helena, Montana.

D. Transportation

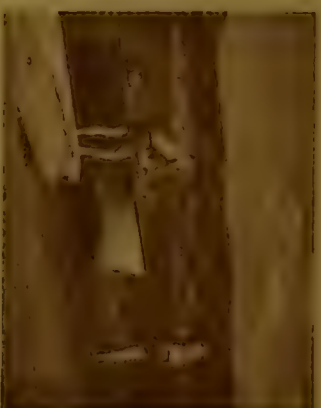
The major highways in the region are U.S. Interstate 15 which connects Boulder and Great Falls and passes through Helena. State Highways 12 and 287 parallel the western shore of the reservoir. Highways 1-15 and 12 are major truck routes for north-south traffic. A secondary highway, No. 284, begins 5 miles east of East Helena and continues northeasterly across Canyon Ferry Dam, passes around the northern end of the reservoir and down the east shore to Townsend where it joins Highway 12. Highway No. 284 is unpaved for about $4\frac{1}{2}$ miles from Magpie Bay Intersection south to Avalanche Bay. It serves the rural population, Canyon Ferry Village, and recreationists on the eastern shore. The west shore drive is approximately 5 miles long, unpaved and very dangerous due to the sharp curves. This drive serves the west shore cabin site lessees and recreationists.

The only major railroad in the Canyon Ferry region is the Burlington-Northern Railroad. The railroad line closely parallels U.S. Highway 12 from Helena and connects to the main east-west line at Logan, east of Three Forks. The main east-west line connects all the major cities in the state.

Bus service is available to all major cities. Both Northwest and Western Airlines serve Helena.

C. Utilities

Electrical service is supplied by Montana Power. Telephone service is supplied by Mountain Bell. All of the concessions at Canyon Ferry and most of the cabin sites have their own sewer systems consisting of septic tanks and drainfields. Cabin sites not having sewage systems and the Fish and Game recreation areas utilize outdoor latrines. Drinking water in the area is obtained from drilled wells as well as from treated lake water.



D. Socio-economic Overview

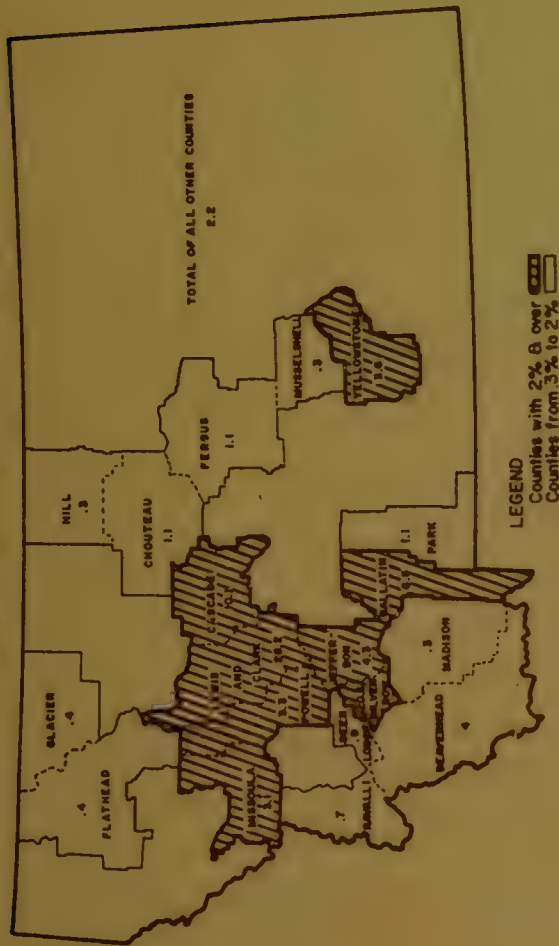
Existing in the region is a highly concentrated urban populace with strong needs for organized recreation and a rural population with minimal needs for organized recreation.



The area immediately surrounding Canyon Ferry Reservoir consists of farms and ranches. Many of these farms and ranches have been in existence since the area was first settled. Highway No. 284 carries the main flow of traffic to Canyon Ferry Reservoir and passes or crosses these farms and ranches.

Two hundred and sixty-six cabin owners on the reservoir lease plots from the Fish and Game Department. These cabin site lessees enjoy prime recreation sites on the reservoir. Some lessees live on the lease year-round, others enjoy seasonal use only. There are also two owners of floating cabins with valid mooring permits.

1975 CANYON FERRY SUMMER VISITATION BY COUNTY, AS A PERCENTAGE OF TOTAL VISITATION



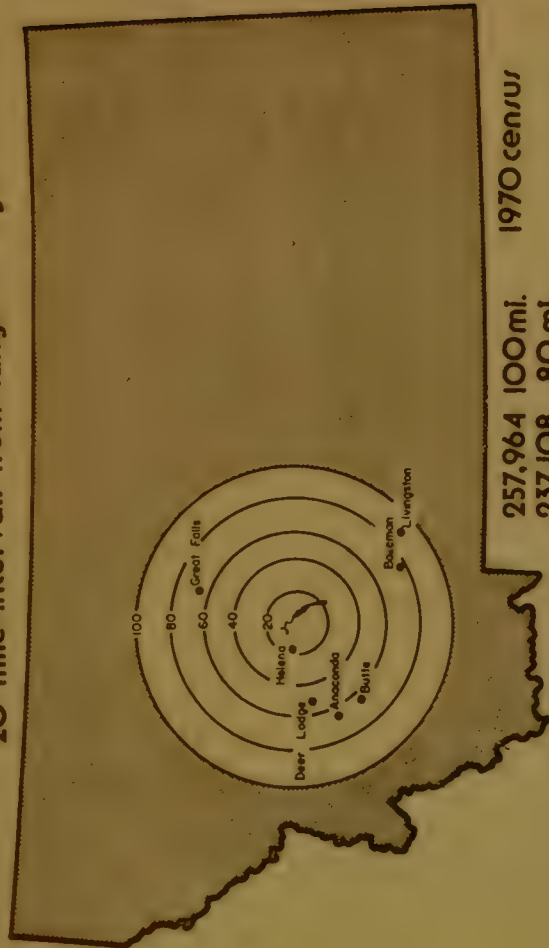
Businesses in proximity to the reservoir area are positively affected by the recreation traffic. Three concessions--Yacht Basin, Kim's Marina, and Goose Bay Marine--were established to serve several service functions--boat mooring, gasoline service, food and accommodations. These concession areas are leased from the Fish and Game Department for 1 $\frac{3}{4}$ % of gross receipts or a minimum of \$500 each year. Townsend, East Helena, and Helena serve day-use and camper recreationists and enjoy the increased revenue from the recreating public.

Broadwater County is a rural area with the largest town, Townsend, having a population of about 2,000 people. The major economic activity is agriculture. Indicative of the economic rural base, this county contributes only two-tenths of one percent of all summer visitors to the recreation areas in the state (from the 1975 survey conducted by the Department of Fish and Game).¹

Lewis and Clark County is quite opposite having a very urban based economy, mainly due to the city of Helena which contains 70% of the county's population. Helena and East Helena are the major employment centers in the county. Living only a few miles from the major recreational areas on the reservoir,² the people of Lewis Clark County contributed 28.2 percent of the summer use of the recreation area (1975 study).

- ¹ State Recreation Survey (1971), section on Planning Region 8, p. 7; NOTE: Region 8 is Broadwater, Lewis and Clark, and Jefferson Counties, of which populace, 55.6% live in Helena.
- ² The north end of the reservoir has the highest concentration of established site access to the reservoir and therefore receives the highest traffic use.

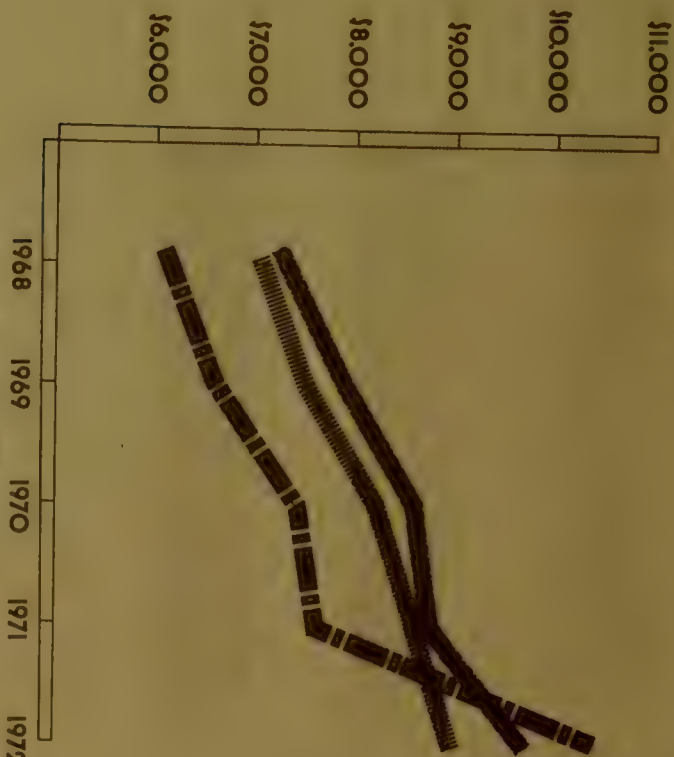
Population densities found at 20 mile intervals from Canyon Ferry



257,964 100 ml.
237,108 80 ml.
95,465 60 ml.
38,340 40 ml.
29,148 20 ml.

CHART 1-1

Average personal income for Broadwater and Lewis and Clark Counties, and Montana, 1968 through 1972



The average annual wage in Montana in 1972 was \$9,964 per worker, a \$909 increase from 1971. The average wage in Lewis and Clark County in 1972 was \$9,002 as compared to \$8,654 in 1971. Broadwater County was higher with an average wage of \$10,437 in 1972 compared to \$7,560 in 1971.

The major source of employment in Lewis and Clark County is government (35.5% in 1972) followed by occupations in service (21.7%) and wholesale and retail trade (16.7%). Of total 1972 personal earnings, 35.1% came from governmental employees, 17.3% from service and 13.5% from whole-sale and retail trade. Since Helena is not only the county seat, but also the state capital, a larger than typical share of the population is engaged in governmental activities. Services and industries are high compared to the state, again indicative of the governmental/urban nature of Lewis and Clark County.

Broadwater County, on the other hand, has an agricultural based economy with 60.1% of total population engaged in agriculture, 22.5% engaged in governmental activities, and 15.6% employed in wholesale and retail trade in 1972. Analysis of total personal income in 1972 found 58.5% accountable to agriculture, 10.7% to government and 10.7% to wholesale and retail trade.

CHART 1-2

Wage and salary earnings in agriculture, government, transportation, communication and public utilities, wholesale and retail trade, and services, by percentage.

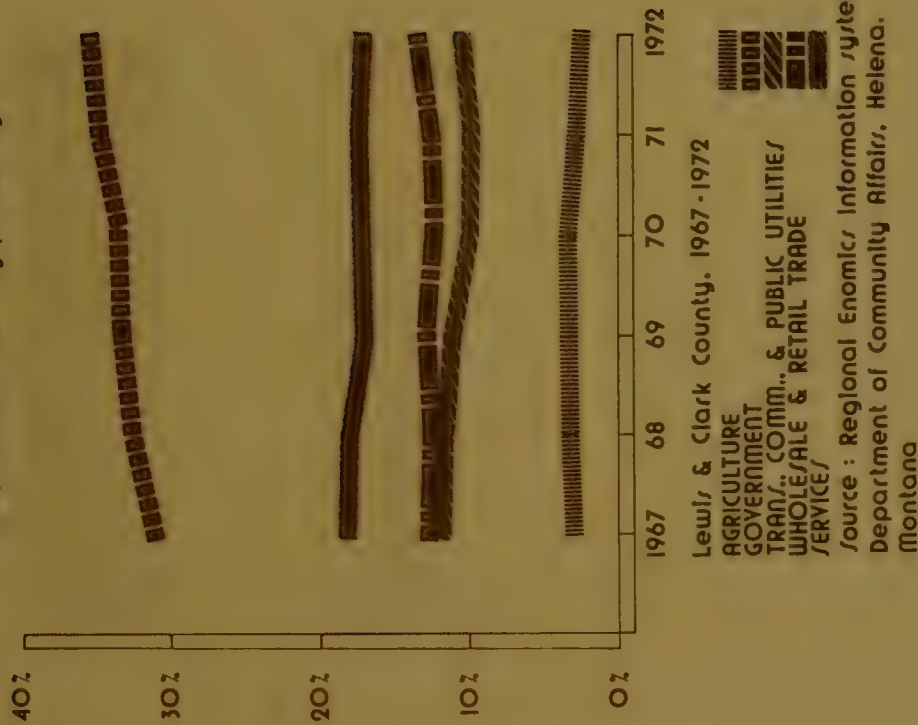
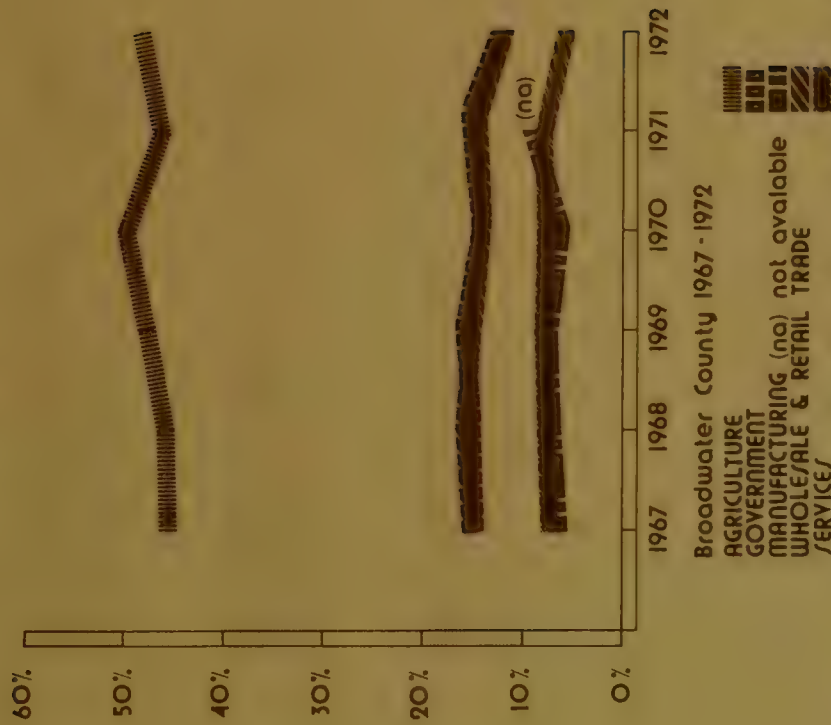


CHART 1-3

Wage and salary earnings in agriculture, government, services, manufacturing, and wholesale and retail trade, by percentage.



Note: 1967 to 1972 changes are due to increases in farm earnings, decreasing the remaining percentages. All classifications increased but relatively less than agriculture.

Source: Regional Economics Information System.
Dept. of Community Affairs, Helena, Montana

TABLE I-2

Population in Montana, Lewis and Clark, and Broadwater Counties, Helena, East Helena, and Townsend; 1960 and 1970 and Percentage Changes

Area	1960	1970	Change
Montana	674,767	694,409	2.8
County			
Lewis & Clark	28,006	33,281	18.8
Broadwater	2,804	2,526	-9.9
City			
Helena	20,227	22,730	12.4
East Helena	1,490	1,651	10.8
Townsend	1,528	1,371	-10.3

Source: U.S. Bureau of Census, 1970 Census: Montana

The survey of 1975¹ found that 65.3 percent of total users were from the four counties within 100 miles of the reservoir containing Helena, Bozeman, Butte and Great Falls. This survey also revealed 88.8% use by state residents and 11.2% use by out-of-state residents. Visitation at Canyon Ferry was 172,112 - 12-hour user days in 1975. This attendance figure was based upon traffic counts and on-site observations.

It has been estimated that out-of-state tourists spend, on the average,

\$35 per day per party of 3½ persons while traveling instate.² It is assumed that a stay at Canyon Ferry would be somewhat less than \$35 per day per party due to the type of accommodations available (tent and trailer camping). Therefore, a value of \$15 per day per party and \$8 per day per party was used in the economic analysis.

CHART I-4

Canyon Ferry 12-hour user days, 1975		
January 1 - June 14		32,211
June 15 - September 1		119,526
September 2 - December 31		20,375
Total		172,112

¹Canyon Ferry Information Use Survey, Recreation and Parks Division, Montana Department of Fish and Game, 1975.

²Mini-Profile, Montana Travel Industry, State Advertising Unit, Montana Department of Highways, 1972.

CHART I-5

Expenditures at Canyon Ferry, Day-Use and Camping,
3 person average, 1974

<u>Day Use</u>	
Food	\$ 2.00
Gasoline	4.00
Miscellaneous	2.00
Total	\$ 8.00
<u>Camping</u>	
Camping Fee	1.00
Food	10.00
Gasoline and miscellaneous, including fishing supplies, boat supplies, etc.	4.00
Total	\$15.00

Analysis of the 1975 survey data showed that on an annual basis 65% of the use was day use and 35 percent was camping.

Using the above day use/camping figures, the expenditures at Canyon Ferry, and 172,112 - 12-hour use figure, revenues of \$1,798,569 were spent by recreationists in 1975 which was the direct economic effect of recreation expenditures at Canyon Ferry.

To gain a rough approximation of the value of the recreation experience to users, the figure of 172,112 - 12-hour user days is multiplied by a value of \$5.00 benefit per recreationist, resulting in a total value of \$860,560.¹

CHART I-6

Operating and maintenance costs: Canyon
Ferry, 1962 to 1974 in thousands of dollars.



Source : Montana Fish & Game Dept.
Recreation & Parks Division, Helena,
Montana

e. health and safety

Water recreation related accidents have been kept to a minimum at Canyon Ferry Reservoir partially due to the enforcement of regulations. Three enforcement agencies work in cooperation to patrol the area--state fish and game wardens on both land and water, U.S. Coast Guard on the water, and Lewis and Clark County sheriff's office on land.



As part of the safety program, boats are inspected for all safety equipment and use is terminated if the particular boat does not meet state and federal standards. Boat hazards in main traffic areas are marked under the private aids to navigation regulations and in cooperation with the Canyon Ferry Recreation Association. With relation to the area immediately surrounding the dam, the Fish and Game has worked out a cooperative safety agreement with the Bureau of Reclamation and has regulations prohibiting boat use within the marked area above and below the dam.

Swimmers are encouraged to use marked swimming areas and scuba divers are encouraged to use diver's flags. Swimming areas are marked with swimming buoys that meet the standards of private aids to navigation.

To control large groups, a permit from the Coast Guard, secured through the Fish and Game office, must be obtained before any boat meets, ski meets or any other regattas or races can be held at Canyon Ferry Reservoir. Permits must also be obtained from the Department of Fish and Game for groups larger than 50 using the recreation area.

As the recreation area has become more populated each year, and consequently received more traffic, the associated likelihood of vehicular accidents has increased around the recreation area.

B. administration of project area

1. bureau of reclamation

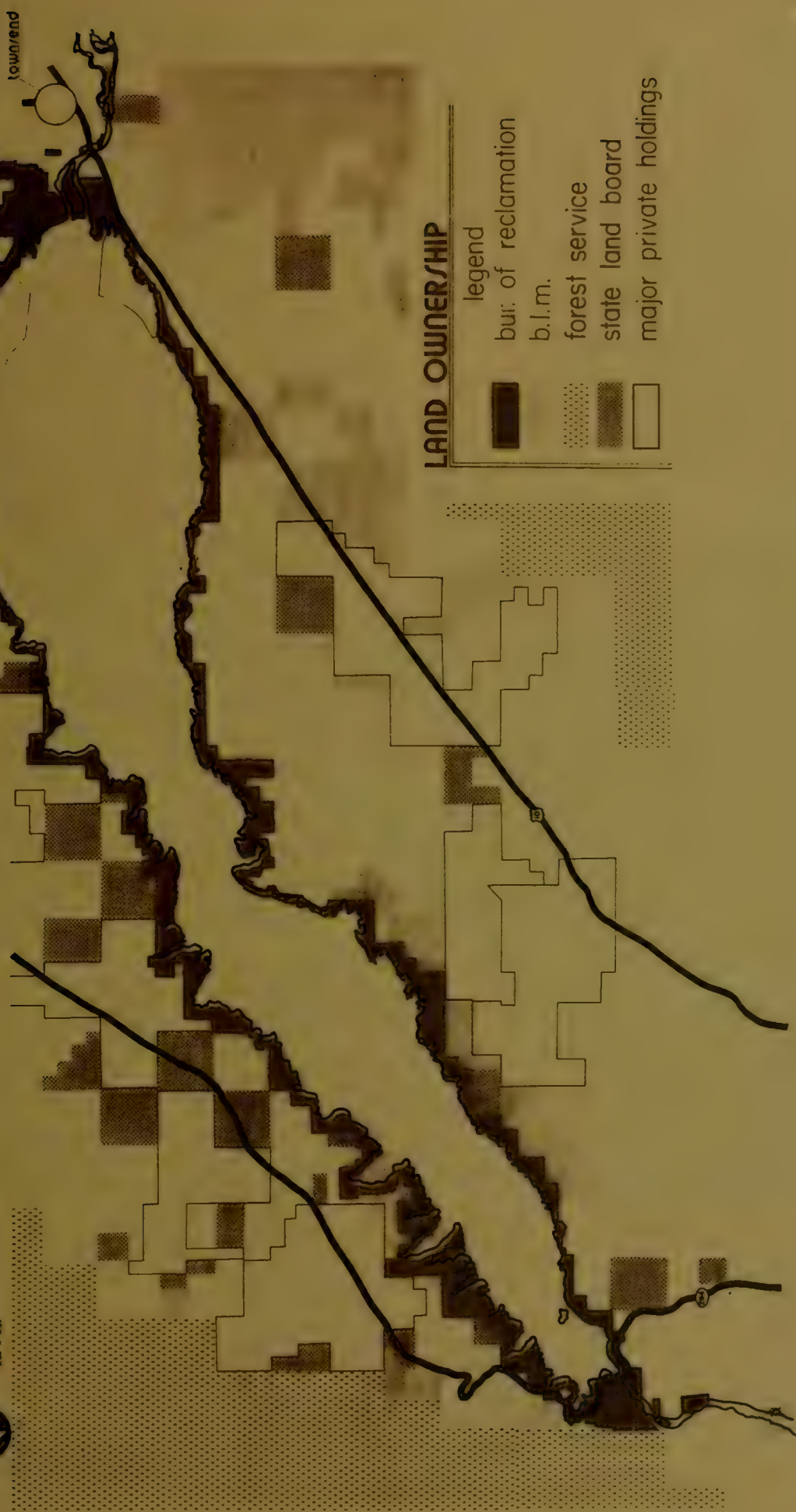
The Bureau of Reclamation developed the reservoir to provide water for hydroelectric generation, additional irrigation, as well as to provide flood control. General operating objectives for water year 1976 were "to meet all conservation commitments, to provide flood control in cooperation with the Corps of Engineers, and to coordinate all operations with the Montana Power Company to achieve optimum benefits from the water resource".

The Canyon Ferry Dam contains three generators which have a combined production capacity of 50,000 kilowatts. At the present time the bureau has no plans for additional development of power generation.

Within the last few years, the Bureau of Reclamation has set policies with respect to the general development and use of Upper Missouri River Region reservoirs for public purposes. The Federal Register provides regulations for off-road vehicle use on reclamation lands to protect the land resource, to promote the safety of all users, to minimize conflicts among the various uses, and to ensure that any permitted use will not result in significant adverse environmental impact or cause irreversible damage to the existing environment. Off-road vehicle traffic is to be confined to an area or trail specifically opened to use of off-road vehicles.

¹ Canyon Ferry Information Use Survey, Recreation and Parks Division Montana Department of Fish and Game, 1975

CANYON FERRY RESERVOIR



LAND OWNERSHIP

- legend
- bur. of reclamation
 - b.l.m.
 - forest service
 - state land board
 - major private holdings

CANYON FERRY RESERVOIR



LAND USE

legend	
irrigated land	
timber	
dry crop land	
river bottom	

Since April, 1974, the Bureau of Reclamation directs that all new or replacement utility lines must be of buried type when located within reservoir areas of the Upper Missouri Region.

A most important policy set by the Bureau of Reclamation in August, 1974, limits further development of reclamation reservoir areas or other water-oriented areas for exclusive or private recreational use, curtailing any further development of permanent or seasonal residences such as cabins, trailers, mobile homes, house boats, condominiums, motels, etc. This policy also extends to areas managed for concession purposes. With the exception of areas presently in private residential and commercial use, all recreation lands and waters of the Upper Missouri Region are required for public purposes.

2. bureau of land management

The Bureau of Land Management, within the Department of Interior, administers property adjacent to the Bureau of Reclamation land along the west shore of Canyon Ferry Reservoir. As directed by law and regulations, the Bureau is responsible for a wide variety of actions including plans to manage or dispose of public lands, in a manner to provide for the maximum public benefit. To accomplish its aim the Bureau works toward protecting the lands, resources, environment and public values therein from avoidable destruction, abuse and deterioration, and correct past abuses to the extent feasible. It must also manage, develop and dispose of public lands and resources to maintain a quality environment, to help meet the people's need for growth of dependent users, industries, communities and regions.

Four sections of this land are under review for possible leasing for non-competitive geothermal resource surveys. The area under consideration includes the Mahogany Cove Public Use Area. If the lease is granted, the possibility of future development and utilization of geothermal energy will be studied. The Bureau of Land Management is now preparing an environmental impact statement for the lease application.

3. department of fish and game

a. recreation and parks division

1) general recreation policy

After the completion of the dam in 1954 by the Bureau of Reclamation, administration and management of recreational aspects of the reservoir were assumed by the State Parks Division of the State Highway Commission. In 1965, the State Legislature passed an act placing administration of state parks under the direction of the Fish and Game Commission. Since that time, recreation at Canyon Ferry has been under jurisdiction of the Fish and Game Department working in conjunction with the Bureau of Reclamation, which owns all land and water areas within the take line of the reservoir.



The State Legislature has passed several acts giving the Fish and Game Commission the authority to acquire, plan and develop outdoor recreational resources in the state and the responsibility of conserving archeologic, scientific and recreational resources of the state for their use and enjoyment, thereby contributing to the cultural, recreational and economic life of the people and their health.

The ultimate goal concerning recreation is that the State of Montana is to provide for the appropriate recreational use of its natural resources, consistent with the capability of the resource to supply such use, and with the obligation to preserve these resources for the benefit and enjoyment of future generations. The general recreation policies for the State of Montana are as follows:

- (1) To provide and maintain access to public lands.
- (2) To acquire land for public access and guarantee its availability for recreation.
- (3) To ensure recreational opportunity to Montana residents and visitors.
- (4) To provide facilities for a balanced array of activities as well as to protect undeveloped areas against over-capacity recreational activity.
- (5) To give adequate attention to and facilitate the needs of the day user as well as the camper.
- (6) To give consideration to year-round recreational needs, accommodating winter activities as well.
- (7) To provide for all outdoor activities, not just those most popular.
- (8) To provide areas of sufficient size and diversity so as to enable the recreationist to devise his or her own recreational experience.
- (9) To give adequate protection to the environment while fulfilling the needs of the recreationist.

- (10) To develop positive programs for activities that might otherwise create special problems, such as snowmobiling and all-terrain vehicles.
- (11) To provide that a share of the recreational opportunity is within reasonable travel distance of population centers.
- (12) To provide recreation with respect to the density and distribution of population.
- (13) To maintain the health and safety of the public while using recreation areas.

2) funding

The Recreation and Parks Division receives money for development at Canyon Ferry through the long-range building fund. This money is appropriated by the legislature for such capital projects as acquisition of land or improvements, planning, capital construction, renovation, and major repair projects.

The funds appropriated by the legislature may be matched by the Bureau of Outdoor Recreation, under the Land and Water Conservation Fund Program. In addition to these matching funds, the Bureau of Reclamation, under the Soil and Moisture Control Program, will match state funds for building roads, fences, traffic control or re-vegetation of areas owned by the Bureau of Reclamation.

Operations and maintenance activities are funded from monies accrued from the state motor fuel tax. That portion of the tax is earmarked for use on department sites where motorboating is allowed.

Revenues from cabin site lessees, camping fees and concession gross receipt fees are combined with similar revenues from other areas, to cover the cost of project administration.



3) cabin sites

After completion of the dam, parcels of land within the project boundary were leased to individuals wishing to build cabins on the lakefront.

At the present time, 266 leases are held by the Recreation and Parks Division. The lease rates are \$25, \$35, and \$100 per year; by 1983 all rates will be a minimum of \$100 per year per lot. The total revenue received in 1975 from cabin site rental was \$15,305.

The cabin sites line the shoreline on the west side of the reservoir from just south of the Chalet Recreation Area to approximately 5 miles south on the West Shore Drive. Most of the cabin sites on the east shore are concentrated around Cave Bay, Maggie Bay and Little Hellgate Bay. The west shore sites are rocky and rough, with tree-covered terrain; the east shore sites are open areas with sparse vegetation. The lots vary in size from 5,000 to 24,000 square feet.

Individuals who own cabins on these lots must sign a lease agreement with the Department of Fish and Game. This lease outlines rules and regulations under which the individuals may retain their interest in the property. In 1974, the cabin owners paid \$185,538.35 in property taxes to the county.

4) floating cabins

In addition to the 266 cabin sites at Canyon Ferry Reservoir, two floating cabin sites are leased in a small bay on the east shore. The owners of floating cabins must follow more stringent rules and regulation than the other cabin site lessees. The rental fee per year is \$100.

5) concessions

When the reservoir was filled, two concession areas were leased to individuals wishing to supply services to the recreating public. An additional concession was added in 1964 to handle the increasing public demand for recreational services. The largest of the three concessions--Yacht Basin Marina--is located on the west shore near the dam site. The other two are located on the northeast shore of the reservoir--one at Cave Bay and the other at Goose Bay.

The yearly rental fee paid by the concessionaires for their areas is one and one-half percent of total gross receipts, or a minimum payment of \$500.00. A total of \$1,955.37 was received from the concessionaires at Canyon Ferry for the calendar year 1974.



Proposed Concession Sign -- for Kim's Marina

The concessionaires are required to sign a lease agreement with the Department of Fish and Game. This lease outlines the rules and regulations the concessionaires must follow to retain their interest in the concession. As a measure of quality control for development, the Fish and Game Department provides professional consulting services to the concessionaires in an effort to form a master plan for each area.

b. enforcement division

The Enforcement Division of the Department of Fish and Game has the obligation to protect fish and wildlife resources and their habitat from willful or negligent destruction by attaining an acceptable level of compliance to regulations and laws relating to fish, game, parks, recreation and certain hunting, boating and snowmobile safety codes.

At the present time, three wardens are assigned only part-time to the Canyon Ferry areas. Their main responsibility is to patrol the area to assure that violations are not taking place, checking fishermen as well

as enforcing hunting and park regulations. During the summer months at Canyon Ferry, both land and water areas are patrolled. All boats and trucks used by fish and game wardens have radio communications with the sheriff's office. Regular enforcement patrols are also made both day and night throughout the year by the Lewis and Clark County sheriff's office.

c. game management division

To meet the ever-increasing demands placed on wildlife resources, the Department of Fish and Game has the obligation to provide the optimum amount of recreation without endangering those resources. To fulfill this obligation, wildlife habitat must be managed to its optimum potential, both in quality and quantity.



The Canyon Ferry Game Management Area totals approximately 8,000 acres, beginning approximately 1 1/2 miles north of Townsend and extending along both shores of the reservoir to 16 miles north of Townsend. The project area lies adjacent to Canyon Ferry Reservoir and includes the Dust Abatement Impounding System now under construction by the Bureau of Reclamation.

Approximately 1,309 acres of the project are leased for agricultural operations; however, the leases are designed to incorporate wildlife management practices and objectives into the farming operation either through grazing systems or diverted acres for wildlife cover or food plots. Livestock grazing has been cancelled on all fenced land below the initial project boundary, involving 1,400 acres of the project area, and vegetation regrowth is now occurring where livestock grazing has not been permitted. Herbaceous seeding, either as cover area or spring barley for food plots, has totalled 20-120 acres a year on the project area. Under the Bureau of Reclamation Dust Abatement Program, three dikes have been constructed creating approximately 1575 acres of wetland and marsh habitat. Fifty-two islands have been built with plans for an additional one hundred islands in the future. Management of these impoundments is geared primarily for Canada geese, mallards, and pintails.



Rainbow Trout

d. fisheries division

The Fisheries Division has the responsibility of providing effective management of Montana's aquatic resources in order to perpetuate desirable natural habitat and animal life, and to preserve and increase fishing opportunities.

A self-sustaining yellow perch population is the basis for a popular fishery at Canyon Ferry Reservoir, particularly during the winter. The primary fish management effort is on trout. Annual plants of rainbow trout, usually 4-6" long, are made. The brown trout population is sustained by natural reproduction. Large mouth bass are taken infrequently.

C. management and direction

1. preamble

The feasibility of various management alternatives relative to recreational aspects of the Canyon Ferry area is based in part upon:

- a) the desirability of recreation activities.
- b) the spacing of the participants in an activity.
- c) the tolerance of the environment to withstand use (carrying capacity).
- d) the compatability of recreation activities to one another.

In order to analyze the various items listed above, data was compiled to include a land resource inventory, a recreation opportunities inventory, a wildlife inventory, a fisheries inventory, and a land use demand information inventory. Much of this information is summarized on various maps indicating such relationships to Canyon Ferry Reservoir. The land resource inventory stratified the land base into distinctive land types integrating factors such as geology, land form, soils, vegetation, relief, slope, aspect, etc.

The recreation opportunities inventory, compared the physical characteristics of the existing recreation settings with varied types of recreation preferences. Factors such as the accessibility, remoteness, visual resource characteristics, attractive features, and visitation capacity elements were taken into consideration.

The wildlife inventory identified the locations and extents of the critical habitats that are required by a number of wildlife species.

The fisheries inventory secured data about the physical, chemical, and biological characteristics. Assessments were made of fisheries importance, non-fisheries uses and management needs.

The land use demand information inventory provides data that describes and defines the range of possible land use demands that are and will be made for the resources of Canyon Ferry Reservoir. It considers the information from the perspective of human needs--what people value, their institutions, work, leisure, incomes--which reflect their lifestyles and thus determine their relationship to the land.

From analysis of these inventories the following management alternatives have been derived:

2. management alternatives

Alternative A

This alternative would provide only recreation activities based on current capacities of existing facilities. Maintenance of existing settings and rehabilitation of deteriorated settings would, however, be provided. No new development or expansion of existing facilities would take place.

Alternative B

This alternative would provide additional development of recreational facilities in order to meet projected demands while maintaining environmental quality. This alternative would also provide a shift of current recreation use, primarily by relieving the high impact use from the current west shore sites.

Alternative C

This alternative would provide maximum development for all types of recreational activities possible within the funding realities available.

3. comparison of alternatives

Alternative A

This alternative would result in a limitation of use which is particularly unsatisfactory in light of the dramatic projection of use for Canyon Ferry. The recreation alternatives open to the public would gradually be reduced. Many people would be required to conform to the recreation developments provided because of a lack of diversity.

Due to the limitation of facilities, recreationists would, in all probability, utilize nondesignated areas thereby creating problems of environmental degradation in such areas. In addition, the need for better control to ensure quality land management precludes continuation within present guidelines.

Alternative B

This alternative would provide additional recreation use of Canyon Ferry Reservoir to meet the projected demand as well as providing protection for wildlife and environmental quality. Under this alternative, recreation opportunities would be provided for a variety of user groups, e.g., convenience campers, canoeists, boaters, fishermen, picnickers, water skiers, swimmers, etc. However, these user groups cannot necessarily be lumped together at all sites in the planning process if quality recreation experiences for any one group can be expected to be provided.

This plan is an attempt to retain a substantial area managed for well planned resource development to meet demands for recreation use.

Alternative C

Under this alternative adverse impacts would be heavy on all of the recreation sites. The physical resources of these sites will not necessarily handle such heavy concentrated impact without a degradation of the environment. Conflicts between user groups would also occur.

The disruption of wildlife by development would be especially noticeable in Alternative C. This alternative emphasizes satisfying all types of recreational activity but is not fully responsive to expressed public needs and desires for environmental quality.

4. selection of the proposal for management

a. selection of proposed action

Water oriented recreation is high on the list of preferred types of activity in Montana; however, lakes, reservoirs, rivers, and streams are of limited availability and, because of high land values, are difficult to obtain. Once land adjacent to water is open to the public, intense recreational use occurs.

This situation presents itself at Canyon Ferry Reservoir. Canyon Ferry Reservoir provides an excellent opportunity for leisure time activities such as camping, picnicking, fishing, swimming and other similar pursuits. However, problems of handling the increased recreationists have occurred. The west shore public use areas are overcrowded due to limited space and topography. The east shore camping areas are also crowded and now have only limited facilities available to the public. Day-use recreationists and campers compete for the same areas, with campers very often taking prime space near the water to the exclusion of other uses. Uncontrolled traffic at the upper end of the reservoir near the retention dikes, when completed, will cause destruction of vegetation, particularly during the hunting season. Access for boaters is limited at the present time.

The immediate responsibility of the Fish and Game Department is to supply recreational facilities and at the same time protect the environment; therefore, Alternative B is the most feasible plan.

This plan is therefore believed to better represent the needs and desires of the public than any of the alternatives. In many cases, these planned developments proposed under Alternative B will enhance areas by providing additional recreation related facilities--sanitation facilities, improved roads, water supplies, picnic tables, and boat ramps. In some cases, these developments will be on new locations where there are no facilities at present; at other areas, only minimum development is necessary.

b. capital expenditures, priorities and cost by phases

It must be emphasized that the following anticipated improvements are dependent solely on legislative appropriations for such planned development.

Phase I

A hunter access site near the upper end dikes will be established at a cost of \$14,000. Access road improvements will be completed at an estimated cost of \$492,000. Day-use sites on the west shore will be rehabilitated at an estimated cost of \$8,000. The access road to Chinaman's will be improved at a cost of \$110,000.

Phase II

An approximate \$50,000 will be appropriated to Court Sheriff and Ponderosa for site protection improvements and improved sanitary facilities where needed along with installation of a boat ramp at the Ponderosa site. \$16,000 will be used to build a hunter access site at the upper end dikes.

Silos Recreation Area will receive \$100,000 in site protection, tree planting, and shelter buildings. \$50,000 is programmed for White Earth for tree planting, site protection and barrier installation. The Chalet and Fish Hawk areas will receive \$100,000 for development of group use facilities.

Phase III

During this period Helligate Recreation Area will receive an estimated \$200,000 for camp area expansion. This is anticipated to relieve the high impact use currently being felt on the west shore sites. During this phase three sites will be developed at selected locations around the reservoir offering boating access, latrines and tables, along with the construction of fencing at Cemetery Island, resulting in a total estimated cost of \$40,000. Cave Bay will receive minor improvements to the public use area at a cost of \$80,000.

The phases described above should be considered to be the maximum practical limit to the amount of funding which might be made available by the legislature. If reduction in funding takes place, the phases will serve as a priority of any proposed work. Adjustments will be made as time, changing needs, and public expression reveal to be appropriate.

C. Fish and game policy on development

- 1) To undertake comprehensive planning as a tool to protect the environment before, during and after construction (and development).
- 2) To assess the environmental impact of recreational use on the resource, following currently prescribed state and federal procedures.

- 3) To give primary consideration to the aesthetic values and to develop in harmony with these characteristics.
- 4) To consider the wildlife values associated with the resource.
- 5) To provide the user with adequate space, privacy and freedom of movement.
- 6) To use high technical and aesthetic standards of construction.
- 7) To enhance the recreational experience by innovative site planning and design and by providing a wider variety of facilities and accommodation.
- 8) To increase the appropriate recreational opportunity at the waterfront by providing a wider range of facilities, particularly for the passive enjoyment of the elderly and the less active visitor.
- 9) To develop where feasible the concept of a "total" recreation area.
- 10) To take into consideration the needs of the handicapped, the aged and the disadvantaged in the development of facilities.
- 11) To plan and develop in such a manner that conflicts of recreation use are minimized.
- 12) To conform to all federal, state, and local regulations with respect to standards for health, sanitation and safety.

d. general management guidance

- 1) Locate, identify, and plan protection for rare and endangered plants and significant areas of ecological, archaeological, geologic, and historic interest. Regulate use to the extent necessary to protect the area's values.
- 2) The recreation role will be based on those land characteristics unique or outstanding to the region and responsive to the needs of people.
- 3) Identify and anticipate the changing patterns of outdoor recreation activities which people seek; and where appropriate, protect recreation resources so they will be available in an unimpaired condition when they become needed.
- 4) Develop a concept of year-round recreation opportunities commensurate with land capability.
- 5) Direct recreation management efforts at capitalizing on the outdoor experiences available on Canyon Ferry Reservoir rather than simply providing facilities.
- 6) Rules and regulations pertaining to recreation areas will be enforced in a manner to adequately protect the visitors as well as the resources.
- 7) Consider contemplative as well as consumptive recreation use.
- 8) Evaluate ecologically significant areas prior to their development of intensive management in order to determine if they should receive a special form of management.

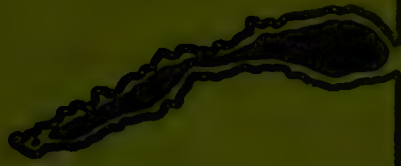


DEVELOPMENT PROGRAM FOR CANYON FERRY

PROPOSED DEVELOPMENT	PHASE I STATE FEDERAL	PHASE II STATE FEDERAL	PHASE III STATE FEDERAL	TOTAL
Heligate - Camp Area			100,000 100,000 B.O.R.	200,000
Access Road Improvement	123,000 369,000 S.B.M.C.			492,000
Rehab. West Shore Drive Day Use Sites	2,000 6,000 S.B.M.C.			8,000
Chinaman's - Access Road	55,000 55,000 B.O.R.			110,000
Court Sheriff - Ramp, Site Protection		25,000 25,000 B.O.R.		50,000
Hunter Access Sites Near Dikes	3,500 1 Site 10,500 S.B.M.C.	4,000 1 Site 12,000 S.B.M.C.		30,000
Boat Access Sites - Latrines, Tables, Cemetery Island Fence			20,000 3 Sites 20,000 B.O.R.	40,000
Silos - Trees, Site Protection, Shelters		25,000 75,000 S.B.M.C.		100,000
White Earth - Trees, Site Protection, Barriers		12,500 37,500 S.B.M.C.		50,000
Chalet & Fish Hawk - Group Use, Day Use, Camping		25,000 75,000 S.B.M.C.		
Cave Boy - Minor Improvements to Public Use Area			20,000 60,000 S.B.M.C.	80,000
TOTAL	183,000 440,500	91,500 224,500	140,000 180,000	1,260,000

CANYON FERRY DEVELOPMENT PROGRAM





II. environmental impact statement

2. The department's eventual long-range plans intend to channel the majority of the overnight visitors to the east shore sites leaving most of the west shore sites for day use only. A rehabilitation program will be implemented to enable resoiling and reseeding of these sites.

3. An always continuing priority will be to maintain and improve the access roads. These improvements will include heavy construction in addition to the routine maintenance on various segments of the road. Major access road improvements are planned for the west shore road and Chinaman's.

4. The Court Sheriff site is one of the most heavily used sites on the lake. Major site deterioration will result without the planned traffic control systems which will regulate use in the area. Sanitary facilities will also be improved.

5. The Silos and White Earth are programmed for landscaping, tree planting, site protection and the construction of picnic shelters in order to enhance these areas.

6. The Chalet and Fish Hawk areas will be developed and improved for group use and day-use activities.

7. Hellgate Recreation Area will receive needed improvements and additional facilities as a major camping area to accommodate recreationists who would normally use the west shore sites.

8. Additional new sites are planned for development to provide boating access, latrines, and tables at selected sites, including Cemetery Island.

A. description of the proposed action

Management and Development Plan for Canyon Ferry has set priorities for development to include:

1. The recently established dust abatement program at the southern end of the reservoir has created new goose habitat. Here, hunter access sites will be developed on a phase basis in order that optimum use of this new resource be reached, and hunter traffic controlled.

9. Cave Bay is programmed to receive improvements to the public use area.

10. No phasing out of any cabin sites is planned and all cabin sites will remain unless a violation of the lease agreement occurs. When the leases are either transferred or renewed, the lot is and will be inspected for compliance with lease terms.

11. The Department of Fish and Game plans to discontinue to grant floating cabin leases when the existing leases expire. No transfer of these leases will be made and no additional expansion will be allowed.

12. In the future, no concession expansion activities on the project area will be allowed if those activities could as well take place on private land. No additional trailer space will be provided on the leased areas. Additional mooring space for boats will be allowed if the need can be demonstrated and the services can be provided within the leased area and in accordance with an approved plan. If mooring space is expanded, land-based support services must be added.

13. Although the Enforcement Division does not have long-range plans calling for additional personnel to the area, a seasonal warden may be needed from the time the ice clears until the waterfowl season has ended in late fall.

14. Long-range plans for the Canyon Ferry Game Management Area include the establishment of desired vegetation communities within the areas managed by the Game Management Division.

Various aquatic species may be planted to hasten the natural succession of preferred species. Additional small grain feeding areas will be needed as development occurs and waterfowl numbers increase and additional project lands will be diverted to fulfill the feeding program, thus holding birds in the area longer and increasing the recreational opportunity.

To increase the quality of pheasant habitat in areas where livestock grazing is no longer permitted, the land will be cultivated to more desirable types of vegetation, allowing a larger pheasant population.

Five-year plans for the area include improving an existing marsh by constructing a small dike; building two-foot bridges across supply canals to facilitate distribution of hunters; adding one-half mile of access road to a parking area and one-half mile of trail for access to the river; continuing boundary and internal fencing on a schedule of five miles per year; building four parking areas at key access points to the waterfowl impoundments; posting boundary and information signs; seeding approximately 300 acres for cover areas; grain plots, 12 miles of dike seeding and introduction of aquatics in the impoundments; and controlling noxious weeds by mechanical methods to comply with requests from the County Weed Board. In addition to these development projects, maintenance of the dikes, bridges, roads, parking areas, and fences will be needed. Total development and maintenance costs in the next five years are estimated at \$141,156 by the Game Management Division.

All other aspects of game management concerning big game and nongame animals in the project area will remain the same as in previous years.

15. Canyon Ferry Reservoir provides an excellent habitat for both game and nongame fish and the present fisheries management plan for Canyon Ferry will continue.

16. On-the-ground development will be started only when administrative manpower and time are available to assure compliance with the approved plan. An environmental analysis report will be prepared for all site specific project proposals.

b. description of the environment

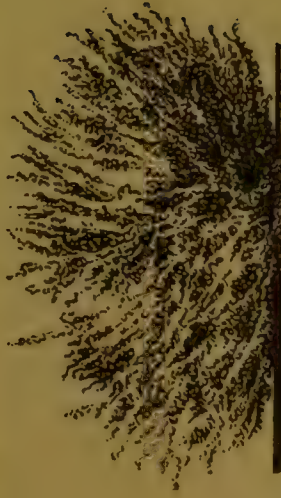
(See Section IA under the Management and Development Plan)

c. the environmental impact of the proposed action

1. biological impacts

a. vegetation

Natural plant succession will eventually be altered as the result of such management activities as road construction and specific site development. In addition, previously untrampled areas will be exposed to varying degrees of foot traffic resulting in compaction of the soil and subsequent loss of vegetation growth in such areas including trails, camping areas and picnic areas.



Big Sagebrush

Soil compaction in these areas will increase water runoff, making less water available for vegetation, increase erosion capability and decrease aeration to plant roots.

b. wildlife

Wildlife habitat will be affected by increased use of the area as a result of traffic, noise and congestion.

2. physical impacts

a. air

Air pollution will occur as the result of:

- 1) Smoke from fires used for camping and picnicking.
- 2) Dust from road construction and traffic over existing and new roads constructed under this plan. Road traffic will generate varying amounts of dust.
- 3) Increased exhaust fumes from projected increasing automotive traffic resulting in some degradation to the local air quality at times of peak use.

b. noise

Projected use increase means the recreation area will receive considerable future noise impact. Noise levels will increase due to increased use, especially due to automobile and boating traffic.

c. landscape alteration

The concept of open space and natural beauty will be decreased with the anticipated increased use of the recreation area. As new areas are developed and existing areas are expanded, more "open space" will be occupied and developed providing new facilities for the recreation enthusiasts.

d. water

Implementation of the proposed land use plan will not significantly affect the quality of the water yield from the area; however, Canyon Ferry Reservoir will receive added pollution on the surface of the water from increased water related activities such as swimming, fishing and boating. Additional use of shore areas will increase the turbidity of the water near the shore in such developed areas.

e. sewage

Implementation of the proposed land use plan will not make sewage disposal a particular problem provided facilities are properly designed.

Pollution could occur, however, from inadequate disposal facilities or a lack of continual maintenance on such facilities.

f. Solid Waste

Quantities of solid waste and litter will continue to increase as the area will have increased user participation. This will result in higher maintenance costs and may require the creation of a land-fill district. This could adversely affect Helena and/or Lewis and Clark County as they attempt to find additional space for solid waste matter.

i. solid waste

Litter will probably always be a problem created by thoughtless individuals. This is detrimental to the natural beauty of the area and thus could have a negative impact to those who must reside and work around the recreational area.



g. health and safety

Projected increases of 336,000 persons, or a doubling of present use in the next ten years, means the recreation area will receive considerable future impact. The problem of vehicle and boating traffic will be increased greatly. Conflicts among recreation users, namely water skiing and speed boating with fishing will occur as use of the reservoir increases.

Increased traffic also means there will be associated increased maintenance on the surrounding roads and access roads.

h. utilities

Impacts from the installation of utility services will be minimal. Some disturbance to soils and vegetation will occur, however.

1. archeological

Any development activities which require ground disturbance could destroy archeological and historical sites. Because artifacts are of primary value through their association with each other and the surrounding environment, loss of site integrity could occur through construction activities. Additional human use of the area will increase the possibility of looting of archeological and historical sites.



The possibility of looting of archeological and historical sites.

3. socio-economic impacts

The effect of Canyon Ferry recreation activities on Broadwater County appears to be minimal. The section of the reservoir encompassed by Broadwater County is the largest in size, but the least used--local use is mainly hunting, fishing and sightseeing activities.

The effect on Lewis and Clark County is quite substantial since 44% of the total in-state users are from this county. Helena residents benefit substantially from the recreation area because the city is only a few miles from the northern end of the reservoir where most of the sites are located.

Day use and camping sites are developed to provide peak day use even though many times of the year these sites are not completely filled. Often the day-use areas near the water are filled with campers in the summer season; consequently, the pattern of use in "designated" areas varied depending on the time of year.

The management and development plan emphasizes taking major impact use from the west shore and dispersing use to the east shore with no substantial increase in day use or camping units.

Social conditions will remain virtually unchanged. No substantial social impact will be felt from a result of implementation of the proposed plan; however, increased management responsibilities will result from "spin-off" effects of current recreational use including probable increased use of snowmobiles, motorcycles, ice boats, etc.

D. planned measures to minimize adverse environmental impacts

1. vegetation

Areas to be disturbed by the construction or renovating of new facilities will be replanted to ensure an aesthetic screening effect, to act as a barrier against erosion, to create organic material (helps absorb water rather than speed runoff) and to help lessen compaction. Existing facilities will be protected and an attractive, pleasing usable environment of high quality will be maintained.

The west shore drive public-use areas will be opened and closed strategically during a given period of time, but the rest-rotate rehabilitation program will not be implemented until facilities to handle the displaced recreationists are first developed on the east shore. Trees and shrubs will only be removed when absolutely necessary.

2. wildlife

Key wildlife habitat, such as big-game winter range, will be managed to maintain or enhance wildlife values.



Resource or use conflicts will be resolved in favor of maintaining or enhancing the overall wildlife picture. Exceptions will be weighed in environmental statements.

Waterfowl tend to select open-type coves which are not confining in appearance and character. Recreational development in these coves will be avoided.

Various aquatic species may be planted to hasten the natural succession of preferred species. Additional small grain feeding areas will be provided as development occurs and waterfowl numbers increase; additional areas will be diverted to fulfill the feeding program, thus holding birds in the area for a longer period of time.

To increase the quality of pheasant habitat in areas where livestock grazing is no longer permitted, the land will be cultivated to more desirable types of vegetation, resulting in larger pheasant population.

3. air

Campfires will be permitted; however, open burning will require a permit from the county. Dust pollution can be reduced by such diverse methods as dust oiling, surfacing, sprinkling, and restricting use.

4. noise

Noise levels will be somewhat reduced by initiation of the following items during the planning and design process.

- 1) Leaving natural vegetation or landscaping buffer strips between motorized use complexes and other recreational areas.
- 2) Improving road surfaces.
- 3) Keeping distances between motorized use areas and other recreational uses at a maximum.
- 4) Keeping vehicle speeds to a minimum.
- 5) Separation of noise impact areas from other areas to avoid conflict. Protective space zoning will assist in these areas.
- 6) Control of numbers using facilities.

5. landscape alteration

All structures and/or improvements will be designed, located, and constructed to conform with, or enhance, the surrounding environment. Development of new or continuance of existing facilities will be predicated upon the capability of the land to sustain use without degrading the site.

Generally, road developments will be designed to fit into the natural terrain as much as possible. Cuts and fills will be kept to a minimum with back slopes as flat as practicable. Ditches will be shallow and will only be used where necessary. Most areas will be "sheet drained" so that natural drainage is preserved.

Vegetation types such as trees and shrubs will only be removed when absolutely necessary, and in most cases will be left for screening and will only be cleared selectively.

During construction, equipment will be confined to road surfaces; no traffic will be allowed outside the construction limits in order that other land forms and vegetation will be left unmarred. Topsoil will be stockpiled before construction and will be replaced on road cuts, fills and road shoulders.

6. sewage

Sanitary facilities at most recreation sites will consist of sealed fiberglass vault latrines conforming to county health standards and will be pumped as required, with the sewage being disposed of at a local (Helena) plant designed to handle the extra load. Facilities in some areas will have on-site disposal systems.

7. solid waste

A generous number of garbage cans, complete with fixed racks, will be collected on a regular schedule. Garbage will be disposed of in accordance with state and county requirements at local land fills.

8. utilities

Necessary extensions to utility systems will be constructed underground, except in areas where costs are prohibitive.

9. existing features

a. Cabin Sites

The Department of Fish and Game plans to reevaluate cabin site policy relative to economics, lease rate schedules, compliance with all health and safety codes, road maintenance and permanent residence of cabins.

b. Floating Cabins

The Department of Fish and Game plans to continue to grant cabin leases with three-year terms provided that lease conditions continue to be met. No expansion over the two present leases will occur. When present parties are no longer interested in maintaining these leases, they will be phased out.

c. Concessions

The status quo will be maintained, placing emphasis on ensuring compliance with all health and sanitary codes and attempting to upgrade facilities where necessary. Expansion to add new marinas will not take place. Expansion of water related services will be considered at existing locations provided the need can be demonstrated and that land based support facilities are also expanded in accordance with an approved plan.

10. socio-economic

Like most pioneering efforts, the information in this section is subject to certain limitations. Only a small amount of research has been done on the relationship of people's lifestyles to resource allocation; consequently, there is a lack of published information.

Increased demand has recently brought to light the need for additional and often new kinds of information. This information will be accumulated over a long period of time and on a continuing basis.

Decisions involving social phenomena, even with the best supporting information and analysis available, are made to a large extent by intuitive judgment. However, used in conjunction with modern research methods, intuitive judgment is no longer a simple and unsupportable reaction to a problem. Research methods relative to socio-economic data will be a continuing process so that site specific proposals can be supported by such analysis and background information.

Implications of user preference will be weighed based on information research on a continuing basis. User preference changes considerably and contributes to the demand use of the area. Such requests will be weighed for inclusion into the management plan for Canyon Ferry taking into consideration the capabilities and limitations of the resource.

11. archeological

The Department of Fish and Game is required by state and federal law to identify and report the presence of any and all prehistoric artifacts, fossils, and objects of historical importance.

E. favorable environmental effects

1. aesthetics

This plan emphasizes aesthetics as being an important value in the planning unit. Management direction stipulated the application of landscape design principles to all major surface disturbing projects. As a result, the maintenance of a pleasing landscape will be maximized remembering, however, that management will cause change.



2. wildlife

The plan provides for delineation, protection, and improvement of key wildlife habitat. There is no anticipated impact on the benefit value for hunters.

Rare and endangered species habitat will be protected whenever identified. Recognition of the habitat requirements of game birds and nongame species is also considered. These guidelines will help to assure that all species in the ecosystem will have a chance to maintain their populations within the planning unit. This plan provides for improvement of an existing marsh by constructing a small dike, building several foot bridges across supply canals to facilitate distribution of hunters, and seeding approximately 300 acres for cover areas.

F. adverse environmental effects which cannot be avoided

1. air

Some air pollution will occur as the result of additional campfires as stipulated in this plan, as well as increased vehicular traffic on gravelled roads surrounding the reservoir

2. noise

Increased noise levels will result, especially at times of peak use, due to the increased access for recreational pursuits.

3. soil

Surface disturbing activities such as road building and construction will cause some increase in soil erosion. Most of this loss is associated with construction activity. This increase can be minimized by incorporating erosion control measures in the location and design of roads.

Increased foot traffic in some concentrated areas will result in varying degrees of compaction of the soil. This increased use and subsequent compaction will increase water runoff, making less water available for vegetation, increase erosion

capability and decrease aeration to plant roots.

4. water

Surface disturbing activities such as road building will affect some of the physical, chemical, and biotic characteristics of water produced in or flowing through the affected area. These adverse effects will be minimized by proper design and layout of projects but cannot be completely eliminated.

Increased boating use may also have some effect upon some of the physical, chemical and biotic characteristics of the water.

G. relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

During the construction phase of the recreational facilities, many noticeable short-term disruptions of the environment could occur. Air pollution in the form of dust and emissions resulting from the construction equipment will cease once the overall project is completed. Disruption of some vegetation will occur during construction, but this, too, will be resolved once the landscaping has an opportunity to become established.

The long-term effect of the recreational facilities upon the wildlife and natural vegetation of the area is expected to be minimal. Canyon Ferry Reservoir is already under the influence of crowded conditions with limited facilities available to the public, resulting in high use concentrations at all of the existing public-use facilities.

Once the total plan is completed in its entirety, new recreational facilities will likely result in the dispersement of users along the peripheral areas of the reservoir. This dispersement of public use will help to counteract the current environmental pollution problems of the existing sites that are associated with overcrowding.

H. irreversible and irretrievable commitment of resources

The loss of land resulting from the construction of recreational facilities is not really irretrievable. These specific sites may be utilized for other purposes, and it is always possible to remove, fill in, cover over, or otherwise destroy such structures so that the land may be converted to its former condition. Fuel consumption used by construction equipment is irretrievable. It has been previously pointed out, however, that completion of the proposed measures will pose some indirect hazards to:

- 1) The quality of the soil in high impact areas.
- 2) The conservation of open space.
- 3) The aesthetics resulting from facility construction, noise and air pollution.

There are, therefore, no commitments of resources involved in this proposed plan which would be considered irreversible or irretrievable of any significance

I. alternatives to the proposed action

See details as outlined in the Management and Development Plan (Sections I C 2 and I C 3).

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Brooks-Walker County Commission
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Water Quality Bureau
Air Quality Bureau
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